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(71) Applicant

Paul Forster

93 Petersham Road, Richmond, Surrey,
United Kingdom

(72) Inventor

Paul Forster

(74) Agent and/or Address for Service

Mewburn Ellis

2 Cursitor Street, London, EC4A 1BQ, United Kingdom

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GB 2252803 A

GB 2239916 A

GB 2087019 A

GB 1009087 A

GB 0979821 A

GB 0783266 A

(58) Field of search

UK CL (Edition K) F2G G4A G4J G4Z

INT CL⁵ F16L 37/40 37/42

(54) Quick release pipe couplings with automatically opened valve

(57) A pipe coupling system, for example, for connecting brake lines of towing vehicles and their trailers, and components for such a pipe coupling system are provided. A female coupling member 2 has an internally threaded end portion 6 for attachment to a brake fluid pipe and an internally tapered portion 8 for receipt of a spigot or tail pipe 16. A continuous fluid passageway 9 extends through the coupling member 2. A boss 12 which is integral to or part of a screw threaded insert is supported by projections 10 that extend to the internal wall. The female coupling member may also be provided with an automatically sealing valve which is openable upon correct insertion of a male spigot member.

Fig.1A.

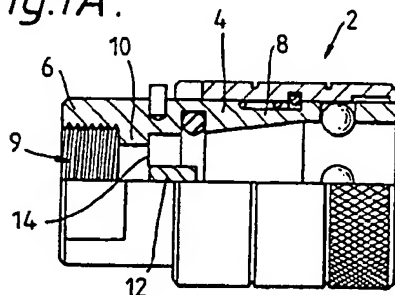
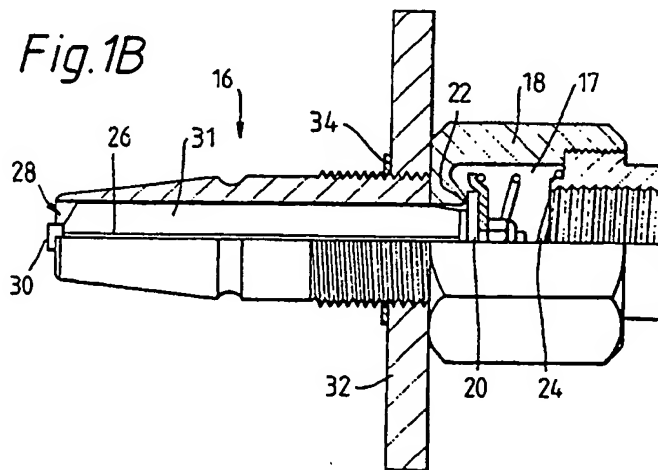


Fig.1B



At least one drawing originally filed was informal and the print reproduced here is taken from a later filed formal copy

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Fig.1A.

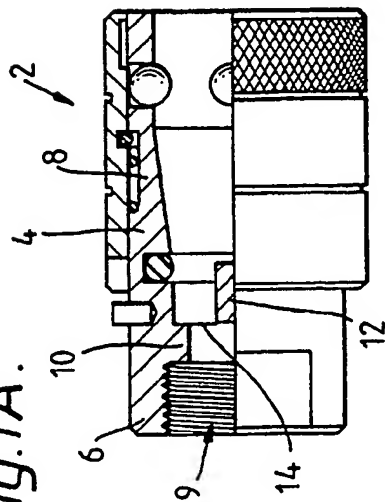


Fig.1B

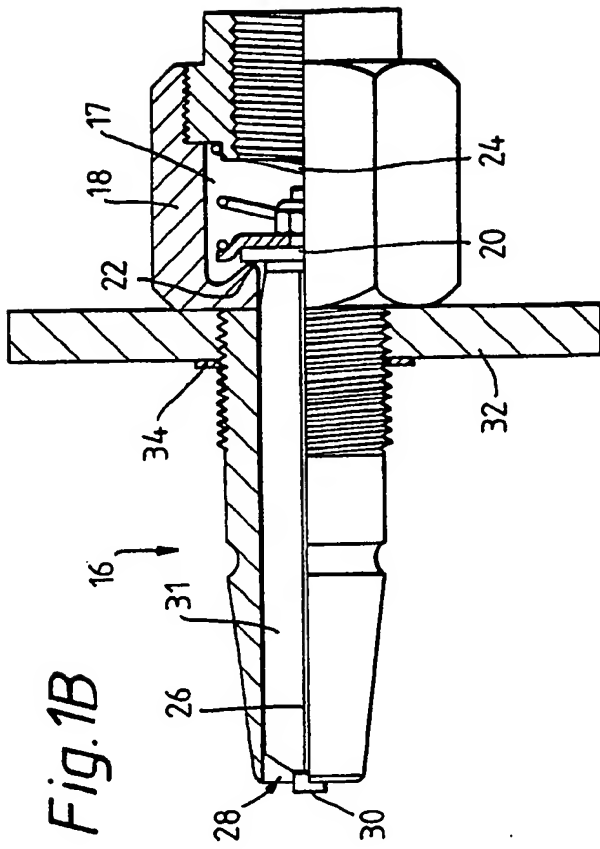
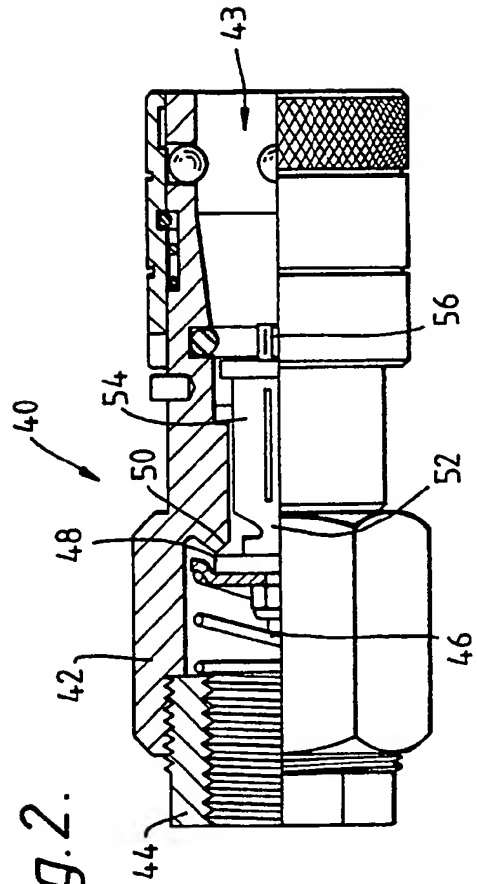


Fig.2.



FLUID PIPE COUPLING

The present invention relates to pipe couplings with automatic shut-off valves, such as for connecting vacuum and pressure braking systems of towing vehicles to the
5 braking systems of trailers.

It is known in the art to have couplings with male and female coupling members the interconnection of which automatically opens a shut-off valve and disengagement of which allows the valve to close
10 automatically.

GB-B-805140 discloses such a pipe coupling structure in which an automatic shut-off valve enclosed in a spigot member is provided with a stem within the fluid passageway of the spigot member. The stem cooperates
15 with a boss in a socket member so as to lift the valve from its seat when the spigot and socket are connected.

The boss of GB-B-805140 is the end portion of an operating adaptor into which the brake pipe end is screwed and which threadedly engages the socket member. There is
20 a danger with such systems where the socket member and the operating adaptor are marketed separately and have different specifications. If it is forgotten to fit an operating adaptor to the socket member then there may be nothing to open the self-sealing valve; the fluid
25 passageway remains closed and the trailer brakes will not operate. This is a highly dangerous scenario. It has proved sufficiently hazardous that the Department of Transport published a warning notice entitled "careless

coupling can kill" to address this precise problem.

It is possible to make this dangerous omission when fitting brake coupling members because the female socket can have the same internal thread for engagement with the operating adaptor as the operating adaptor has for engagement with the brake pipe of the towing vehicle or its trailer.

It can be equally dangerous if an incorrect operating adaptor is fitted, since this may result in inadequate sealing between socket member and adaptor and consequent leakage of the brake system fluid.

The present invention seeks to avoid these risks of careless assembly or coupling of brake fluid lines by providing a structure in which the connection of incorrect adaptors or the omission of an adaptor is rendered impossible or at least much more difficult than in the prior art.

The present invention provides a female socket member for pipe couplings which has a unitary body member for receiving a male coupling member in the end portion thereof and with threaded engagement means at the other end portion thereof for connection to a threaded end portion of a pipe such as a brake pipe, and a boss supported by an inner wall of the body member to be positioned axially within the body member for abutment with the actuator of a sealing valve on the male coupling member of the coupling, characterized in that the body member is unitary.

The boss is preferably integral with the body

member. The boss and supports between it and the socket member may be formed by spark erosion or casting or molding, providing a continuous fluid passageway.

Alternatively, the boss and supports may be parts of an
5 insert such as a threaded insert which engages a threaded internal wall of the socket member. This threaded internal wall may be the same as that providing the threaded engagement means. Such an insert may be used with existing female socket members such as that shown in Fig. 2
10 of GB-B-805140. The insert can be fixed in place on manufacture of the socket member thereby effectively replacing the doubly threaded operating adaptor of the prior art and avoiding the aforementioned risks of careless assembly or coupling.

15. The present invention additionally or alternatively provides a pipe coupling system having a male member and a female member each with a continuous fluid passageway passing therethrough wherein there is an automatic shut-off valve within the male member for closing
20 the fluid passageway and wherein the female member has a unitary body portion having threaded engagement means at an end portion thereof for connection to the threaded end portion of a brake pipe and has an axially positioned boss for abutment with the valve so as to open the valve on
25 correct interconnection of the male and female members, the boss bearing directly or indirectly on the internal wall of the female member so as to fix the position of the boss relative to the female member and provide reaction for the

operation of the valve.

The boss and supports are preferably integral with the body member of the female member. Alternatively they may be parts of a threadedly engaged insert.

5 In another aspect of the present invention, a female member for a pipe coupling is provided which has a unitary body member and an automatic sealing valve disposed within the body member. The unitary body member has threaded engagement means at an end portion thereof for
10 engagement of an adaptor. Preferably an adaptor for attachment of a brake fluid line threadedly engages the body member and provides a support for the automatic sealing valve. The body member has a tapered portion with sealing and locking means for receipt of a spigot member as
15 is known in the art.

The unitary body member of this aspect of the invention avoids the problem of fluid leaks that is present in prior art systems where the outer body is non-unitary.

20 The present invention will now be described in more detail with reference to the accompanying drawings in which:

Figs. 1a and 1b are part sectional views of male and female portions respectively of a coupling system which
25 is an embodiment of a first aspect of the present invention.

Fig. 2 is a part-sectional view of a female portion of a coupling system which is an embodiment of a

second aspect of the present invention.

In Fig. 1a, a female coupling member 2 is shown which comprises a cylindrical body 4 with an internally threaded first end portion 6 for attachment to a brake
5 fluid pipe or other apparatus and an internally tapered portion 8 for receipt of a spigot or tail pipe.

A continuous fluid passageway 9 extends through the coupling member 2.

Between the threaded end portion 6 and the
10 tapered portion 8, a pair of projections 10 extend inwardly from the wall of the body 4 to support an axially extending boss 12 positioned at the axis of the female coupling member 2 in the continuous fluid passageway 9. The boss 12 and supporting projections 10 are integral with the body
15 4 and may be shaped by spark erosion of the female coupling member 2 to provide two apertures 14 for fluid flow.

There may be a larger number of supporting
projections, the only restriction on the number being that a sufficiently unrestricted continuous flow passage must be
20 maintained and that the projections must have sufficient collective strength to support the boss 12.

Alternatively, the threaded end portion may extend further than is shown in Fig. 1a, and the integral boss 12 and supporting projections 10 of the embodiment
25 shown in Fig. 1a may be replaced by an insert such as a threaded insert which forms a permanent feature of the female member 2 and which is not affected by and does not affect the attachment of other apparatus to the threaded

end portion 6.

Locking means for firm connection of a male coupling member and an elastomeric ring disposed in a recess for providing a fluid-tight sealing with the male member are provided, as is known in existing coupling systems.

A male coupling member 16 is shown in Fig. 1a which is suitable for coupling to the female member 2.

An automatically sealing valve 17 is housed in a chamber 17 of a body member 18 of the male member 16. A disc 20 of the valve is held against a seat 22 by a compression spring 24 when the male member 16 is not coupled to a female member.

A stem 26 extends axially along the central axis of a fluid passageway 28 in the male member 16. The stem ends in a stop member 30 at its end distal from the valve and has laterally extending ribs 31 along substantially the whole of its length which maintain its position at the centre of the passageway 28. When coupled to a female member such as the female member 2 of Fig. 1a the stop member 30 abuts against the boss 12 and lifts the disc 20 from its seat 22 to open the valve. The male member 16 is tapered to cooperate with the internal taper of the female member. Locking means for fixed connection to a female member are provided as is known in the art.

A disc shaped thrust plate 32 is threadedly engaged with the outer surface of the male member 16 for ease of coupling. The thrust plate is held in position by

a circlip 34. The circlip is not essential to the invention and the thrust plate may be fixed in position by other means.

In an embodiment of a second aspect of the present invention, a female coupling member 40 is provided, as shown in Fig. 2. The female member 40 has a unitary body member 42 which has an internally threaded first end portion and an internally tapered second portion. A continuous fluid passageway 43 extends through the body member which is closable by an automatic sealing valve disposed within the fluid passageway 43. A threaded adaptor 44 for connection of a brake fluid line or an adaptor or other apparatus is engaged in the threaded end portion of the body member 42. The adaptor 44 provides support for a compression spring 46 disposed within a chamber 47 in the body member 42. The spring 46 biases a disc 48 against a circular seat 50 when the female member 40 is not connected to a male member. A stem 52 extends axially from the centre of the disc 48 on its opposite side to the compression spring 46. The stem 52 has laterally and axially extending wings 54 which maintain the stem's central alignment within the body member. The stem ends in an axially positioned stop member 56. The female member 40 has fluid-tight sealing means and locking means for attachment of a male member, as is known in the prior art. A male coupling member for use with the female member 40 of Fig. 2 will have an axially positioned boss fixed within its fluid passageway for abutment with the stop

member 56 so as to lift the valve from its seat 50 and open the valve when the male and female members are coupled.

CLAIMS:

1. A female socket member for pipe couplings which has a unitary body member for receiving a male coupling member in the end portion thereof and with threaded engagement means at the other end portion thereof for connection to a threaded end portion of a pipe such as a brake pipe, and a boss supported by an inner wall of the body member to be positioned axially within the body member for abutment with the actuator of a sealing valve on the male coupling member of the coupling, characterized in that the body member is unitary.
2. A socket member according to claim 1 wherein said boss is integral with the socket member.
3. A socket member according to claim 1 or 2 wherein said boss positioned axially within the body member has supporting projections extending to the internal wall of the body member, the projections being shaped to allow flow of fluid through the body member.
4. A socket member according to claim 1 wherein said boss positioned axially within the body member is part of an insert.
5. A socket member according to claim 4 wherein said insert includes supports for the boss which are shaped to

provide a continuous fluid passageway through the socket member, and said insert is threaded to engage a threaded internal wall of the socket member.

6. A socket member according to claim 5 wherein the threaded internal wall is part of the threaded end portion.

7. A pipe coupling system having a male member and a female member each with a continuous fluid passageway passing therethrough wherein there is an automatic shut-off valve within the male member for closing the fluid passageway and wherein the female member has a unitary body portion having threaded engagement means at an end portion thereof for connection to the threaded end portion of a brake pipe and has an axially positioned boss for abutment with the valve so as to open the valve on correct interconnection of the male and female members, the boss bearing directly or indirectly on the internal wall of the female member so as to fix the position of the boss relative to the female member and provide reaction for the operation of the valve.

8. A pipe coupling system according to claim 7 wherein said boss is integral with the socket member.

9. A pipe coupling system according to claim 7 wherein said boss is supported in its position by projections extending to the internal wall of the female

member.

10. A pipe coupling system according to any of claims 7 to 9 wherein the boss is part of an insert.

11. An insert member for use in pipe couplings
5 wherein said insert has a threaded external surface to engage part of the threaded engagement means at an end portion of a unitary female member, said threaded engagement means being for connection to a threaded end portion of a pipe such as a brake pipe, and said insert has
10 a boss supported at its axial centre such that when said insert is engaged with said part of the threaded engagement means, there is a continuous fluid passageway through the unitary female member.

12. A female member for a pipe coupling having a
15 unitary body member and an automatic sealing valve disposed within the body member, said body member having threaded engagement means at an end portion thereof for engagement of an adaptor.

13. A female member according to claim 12 wherein an
20 adaptor is included which adaptor for attachment of a brake fluid line threadedly engages the body member and provides a support for the automatic sealing valve.

14. A female member according to claim 12 or 13

wherein said automatic sealing valve comprises a disc held
in abutment with a seat by means of a compression spring,
said disc being displaceable from said seat when the spigot
of a male member is positioned correctly in the female
5 member.

15. A pipe coupling system having a female member
according to any of claims 12 to 14.

16. A component of a pipe coupling system or a pipe
coupling system substantially as herein described, and
10 with reference to the accompanying drawings.

Examiner's report to the Comptroller under
Section 17 (The Search Report)

Application number

GB 9221388.3

Relevant Technical fields

(i) UK Cl (Edition K) F2G G4A G4J G4Z

(ii) Int Cl (Edition 5) F16L 37/40 37/42

Search Examiner

R J DOWNING

Databases (see over)

(i) UK Patent Office

(ii)

Date of Search

13 NOVEMBER 1992

Documents considered relevant following a search in respect of claims 1-10

Category (see over)	Identity of document and relevant passages	Relevant to claim(s)
P X	GB 2252803 A (ARNOLD HOSE) see Figures 2 and 4	1,3,4,7,9 10
X	GB 2239916 A (AEROQUIP) see the whole document	1,3,4,7,9 10
X	GB 2087019 A (ARGUS) see the whole document	1,4,7,10
X	GB 1009087 (AEROQUIP) see the whole document	1,2,7,8
X	GB 979821 (ZENITH)	1,3,4,7,9 10
X	GB 783266 (WURGBURGER) see Figures 1 and 3	1,4,7,10

SF2(p)

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Category	Identification of document and relevant passages	Relevant to claim(s).

Categories of documents

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